

- 22 -

CLAIMS

1. A valve assembly including:

5 a housing having a water supply inlet, a hot water outlet, a cold water outlet, a hot water flow passage between said water supply inlet and said hot water outlet and a cold water flow passage between said water supply inlet and said cold water outlet;

10 hot water valve means in said housing adapted to open said hot water flow passage in response to entry of water above a predetermined temperature into said housing through said water supply inlet and to close said hot water flow passage in response to entry of water below said predetermined temperature into said housing through said water supply inlet;

15 first cold water valve means adapted to open said cold water flow passage at a first position in response to entry of water below said predetermined temperature into said housing through said water supply inlet and to close said cold water flow passage at said first position in response to entry of water above said predetermined temperature into said housing through said water supply inlet;

20 second cold water valve means in series with said first cold water valve means and adapted to open said cold water flow passage at a second position in response to a predetermined drop in pressure at said hot water outlet and to close said cold water flow passage at said second position in response to a predetermined increase in pressure at said hot water outlet.

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2. A valve assembly including:

- 23 -

a housing having a water supply inlet, a hot water outlet, a cold water outlet, a hot water flow passage between said water supply inlet and said hot water outlet and a cold water flow passage between said water supply inlet and said cold water outlet;

hot water valve means adapted to open said hot water flow passage in response to entry of water above a predetermined temperature into said housing through said water supply inlet and to close said hot water flow passage in response to entry of water below said predetermined temperature into said housing through said water supply inlet or in response to water in said housing cooling below said predetermined temperature;

first and second cold water valve means adapted to open said cold water flow passage in response to entry of water below said predetermined temperature into said housing through said water supply inlet or water in said housing cooling below said predetermined temperature and a predetermined drop in pressure at said hot water outlet and to close said cold water flow passage in response to entry of water above a predetermined temperature into said housing through said water supply inlet and a predetermined increase in pressure at said hot water outlet.

3. A valve assembly according to Claim 1 or Claim 2, wherein said hot water valve means and said first cold water valve means include mechanically operable actuation means which are directly responsive to the temperature of water entering the housing through said water supply inlet.

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4. A valve assembly according to Claim 3, wherein said actuation means include an actuator shared by said hot

- 24 -

water valve means and said first cold water valve means which is adapted to simultaneously open the hot water flow passage and close the cold water passage and vice versa.

5 5. A valve assembly according to Claim 4, wherein said actuator is in the path of water entering said housing through said water supply inlet.

10 6. A valve assembly according to Claim 5, wherein said actuator is mounted in an inlet chamber which forms part of the hot water flow passage when water is flowing from said water supply inlet to said hot water outlet and part of the cold water flow passage when water is flowing from said water supply inlet to said cold water outlet.

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7. A valve assembly according to Claim 1 or Claim 2, wherein said second cold water valve means includes a diaphragm in fluid communication with said hot water outlet which is adapted to move in response to a change in the static pressure of water at said hot water outlet.

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8. A valve assembly according to Claim 7, wherein said cold water flow passage passes through a valve seat and said diaphragm is adapted to engage with said valve seat or is connected to a valve member adapted to engage with said valve seat to thereby close the cold water flow passage.

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9. A valve assembly according to Claim 8, including biasing means for biasing said diaphragm or said valve member into engagement with said valve seat.

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- 25 -

10. A valve assembly according to any one of Claims 7 to 9, including a bleed passage between said water supply inlet and said hot water outlet so as to allow continuous fluid communication between said water supply inlet and  
5 said hot water outlet.

11. A water recovery system for recovering standing water from one or more hot water delivery pipes in the water reticulation system of a building, the water recovery  
10 system including:

water storage means adapted to store recovered standing water;

a mechanically actuated diverter valve mounted in a hot water delivery pipe for selectively diverting water  
15 from the hot water delivery pipe to said water storage means upon opening of an outlet tap or valve in the hot water delivery pipe downstream of the diverter valve until the water flowing through said diverter valve reaches a predetermined temperature;

20 a suction device or a pump connected to a cold water supply pipe or delivery pipe having an inlet connected to said water storage means, said device or pump being adapted to draw water from said water storage means into the cold water supply pipe or delivery pipe.

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12. A water reticulation system for a building, including cold water supply means, hot water supply means, one or more cold water delivery conduits in fluid communication with said cold water supply means and one or more cold  
30 water outlets and one or more hot water delivery conduits in fluid communication with said hot water supply means and one or more hot water outlets, and a water recovery system

- 26 -

adapted to recover standing water from at least one of said hot water delivery conduits, the water recovery system including:

water storage means adapted to store recovered water;

5 a mechanically actuated diverter valve mounted in a hot water delivery pipe upstream of one of said one or more hot water outlets and downstream of said hot water supply means for selectively diverting water from that hot water delivery pipe to said water storage means upon opening of  
10 said one outlet until the water flowing through said diverter valve reaches a predetermined temperature; and

a suction device or a pump connected to a cold water supply pipe or delivery pipe having an inlet connected to said water storage means, said device or pump being adapted  
15 to draw water from said water storage means into the cold water supply pipe or delivery pipe.

13. A water reticulation system according to Claim 12, wherein said cold water delivery pipe is a pipe which is  
20 arranged to supply cold water to the hot water supply means and said suction device or pump is a venturi type suction device.

14. In a water reticulation system of a building including  
25 cold water supply means, hot water supply means, one or more cold water delivery conduits in fluid communication with said cold water supply means and one or more cold water outlets and one or more hot water delivery conduits in fluid communication with said hot water supply means and  
30 one or more hot water outlets, the recovery system being adapted to recover standing water from at least one of said hot water delivery conduits and including:

- 27 -

water storage means adapted to store recovered water;

a mechanically actuated diverter valve mounted in a hot water delivery pipe upstream of one of said one or more hot water outlets and downstream of said hot water supply means for selectively diverting water from that hot water delivery pipe to said water storage means upon opening of said one outlet until the water flowing through said diverter valve reaches a predetermined temperature; and

a suction device or a pump connected to a cold water supply pipe or delivery pipe having an inlet connected to said water storage means, said device or pump being adapted to draw water from said water storage means into the cold water supply pipe or delivery pipe.

15 15. A method of modifying a water reticulation system including cold water supply means, hot water supply means, one or more cold water delivery conduits in fluid communication with said cold water supply means and one or more cold water outlets and one or more hot water delivery conduits in fluid communication with said hot water supply means and one or more hot water outlets, and a water recovery system adapted to recover standing water from at least one of said hot water delivery conduits, the modification including:

25 providing water storage means;

fitting a mechanically actuated diverter valve to a hot water delivery pipe upstream of one of the one or more hot water outlets and downstream of the hot water supply means, said diverter valve being adapted to selectively divert water from that hot water delivery pipe to said water storage means upon opening of said one outlet until

- 28 -

the water flowing through said diverter valve reaches a predetermined temperature; and

fitting a suction device in one of the cold water delivery conduits, the suction device being adapted to draw  
5 water into said cold water delivery conduit from said water storage means and deliver it to one of the cold water outlets.

16. A valve assembly as hereinbefore described with  
10 reference to the accompanying drawings.

17. A water reticulation system as hereinbefore described with reference to the accompanying drawings.

15 18. A water recovery system as hereinbefore described with reference to the accompanying drawings.

19. A method as hereinbefore described with reference to the accompanying drawings.